

Carolina Biological Supply Company

**AUTOPSY: Forensic Dissection
with Carolina's Perfect Solution® Pigs**



#carolinaNSTA

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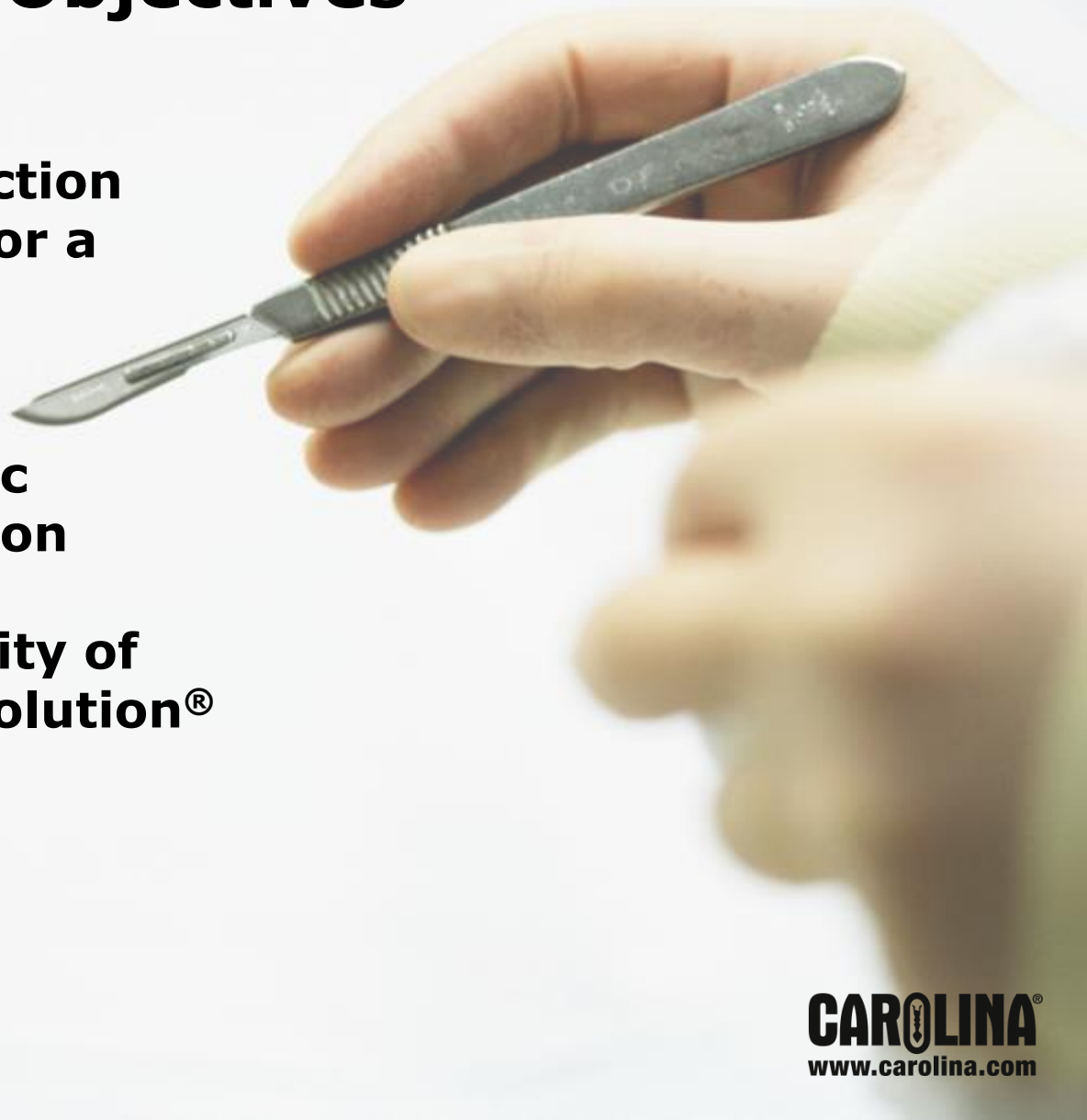
Wear Your Tee and Enter to Win a **FREE** Kit of **YOUR** Choice!



- To be eligible, you **MUST** wear your “Perfect” T-shirt to the Carolina booth.
- Turn in your completed entry form to a staff member from **PRESERVED MATERIALS**.
- One winner will be chosen after the show. (You need not be present to win.)

Objectives

- **Conduct a pig dissection using the protocol for a human autopsy**
- **Learn an exciting approach to a classic mammalian dissection**
- **Experience the quality of Carolina's Perfect Solution® specimens**

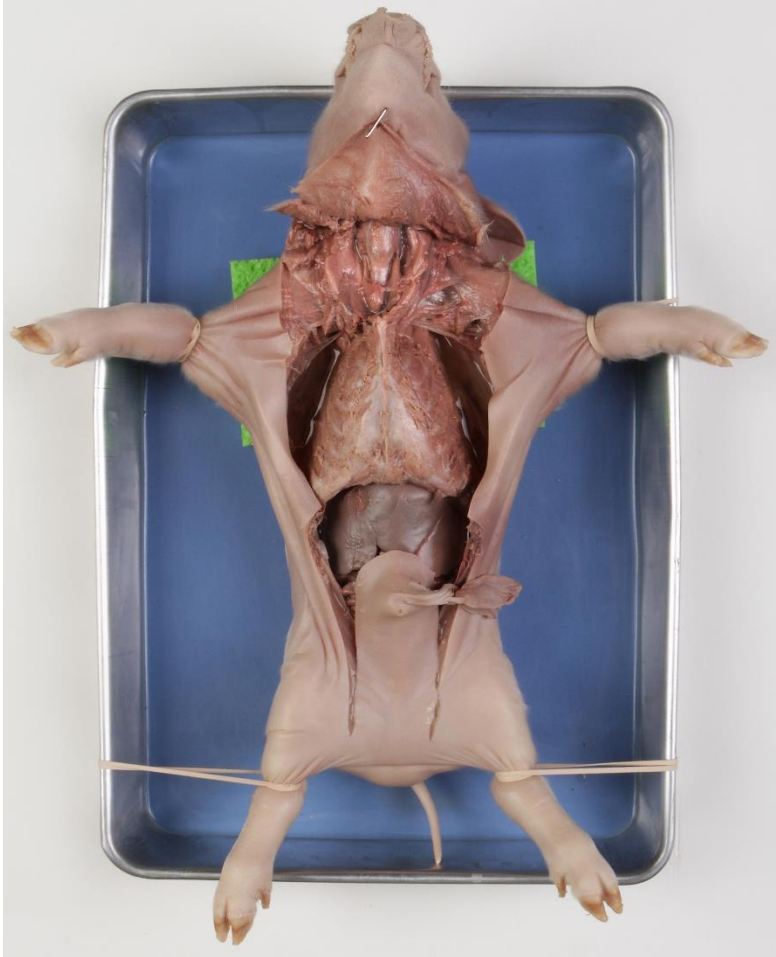


Building Towards 3-Dimensional Learning

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Developing and using models <ul style="list-style-type: none">• Develop a model for conducting a dissection on several species of vertebrates. | LS 1: From molecules to organisms: Structures and processes <ul style="list-style-type: none">• The process of a dissection preserves organ and tissue structure for comparison and analysis. | Structure and function <ul style="list-style-type: none">• Examine the structures of different components and their interconnections to reveal a systems function. |

Next Generation Dissections

Learning Context



- **Forensic Science**—Inquiry, anatomy and physiology, autopsy techniques
- **Advanced Placement® Biology**—Evolution explains the diversity and unity of life
- **Anatomy and Physiology**—Comparative anatomy
- **High School and Middle School Life Science**—Body structure and functions

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Carolina's Perfect Solution[®] Specimens

Quality

**Superior
preservation**

**Superior
tissue color
and texture**

Safety

**No
dangerous
off-gassing**

**No formalin
odor**

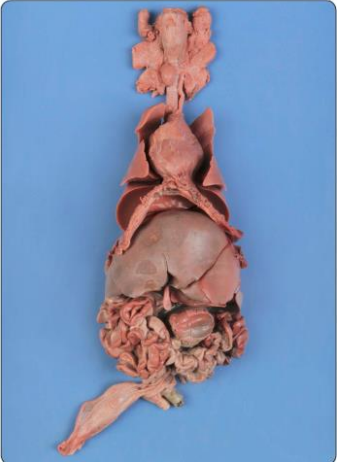




Carolina® Forensic Dissection Kit



This workshop features activities from one of our most popular dissection kits!

Excerpt from Kit Manual

Students fill out a detailed autopsy report as they perform a thorough examination of the external and internal anatomy.

| STUDENT GUIDE | Laboratory Investigation (continued) | Carolina® Forensic Dissection | Investigation (continued) | STUDENT GUIDE | | | | | | | | | | | | | |
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| <p>Internal Anatomy: Removing the Organ Block</p> <ol style="list-style-type: none">1. Make a cut just above the larynx, a hard-bulbous structure that contains the vocal cords (Figure 10) and pull downward, sliding your hand behind the structures of the neck, including the thymus and thyroid (to be discussed in a later section), as they become separated from the body wall (Figure 11). Make these structures are removed as one unit.2. Detach the heart and lungs from the spine with a scalpel or scissors, as you continue to gently pull down (Figure 12). Again, keep one hand behind the structures at all times for support.3. Cut the diaphragm away from the walls of the body cavity and pull the abdominal organs out and down (Figure 13).4. Using a scalpel or scissors, sever the pelvic ligaments, urinary bladder, and rectum located at the posterior wall of the abdominal cavity. Make these cuts as close to the posterior wall of the abdominal cavity as possible. Remove all of the organs in one block. The empty body cavity should resemble that pictured in Figure 13.5. Place the entire block of organs (Figure 14) in an adjacent dissecting pan. Note how the organs are connected and how their symmetry allows for a perfect fit in the body cavity.6. Follow your teacher's instructions for the handling of the empty body cavity. It may simply be placed in its original plastic storage bag, depending on the duration of your dissection.  <p>Figure 14</p> | |     <p>TEACHER'S MANUAL AND STUDENT GUIDE</p> <p>CAROLINA® www.carolina.com</p> | | <p>Date _____</p> <p>Autopsy Report</p> <table border="1"><thead><tr><th>Diener</th><th>Materials Manager</th><th>Recorder</th></tr></thead><tbody><tr><td></td><td></td><td></td></tr></tbody></table> <p>Weight _____ g Length _____ cm Age from Conception _____ days</p> <p>Observations</p> <table border="1"><tbody><tr><td></td></tr><tr><td></td></tr><tr><td></td></tr><tr><td></td></tr><tr><td></td></tr><tr><td></td></tr><tr><td></td></tr></tbody></table> <p>(including Genitalia)</p> | Diener | Materials Manager | Recorder | | | | | | | | | | |
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Safety

- **Personal protective equipment:
Gloves, goggles, and lab aprons**
- **Dissection tools:
New tools = sharp scalpels**



- **Safety tip:
If you are not using an
instrument, set it down**

Teacher Tip

1. Hold bag upright.
2. Cut below the seal.
3. Allow fluid to drain into the bag before removing pig.
4. Keep bag upright until we collect fluid.



Teacher Tips

**Use sponge as
"body block."**

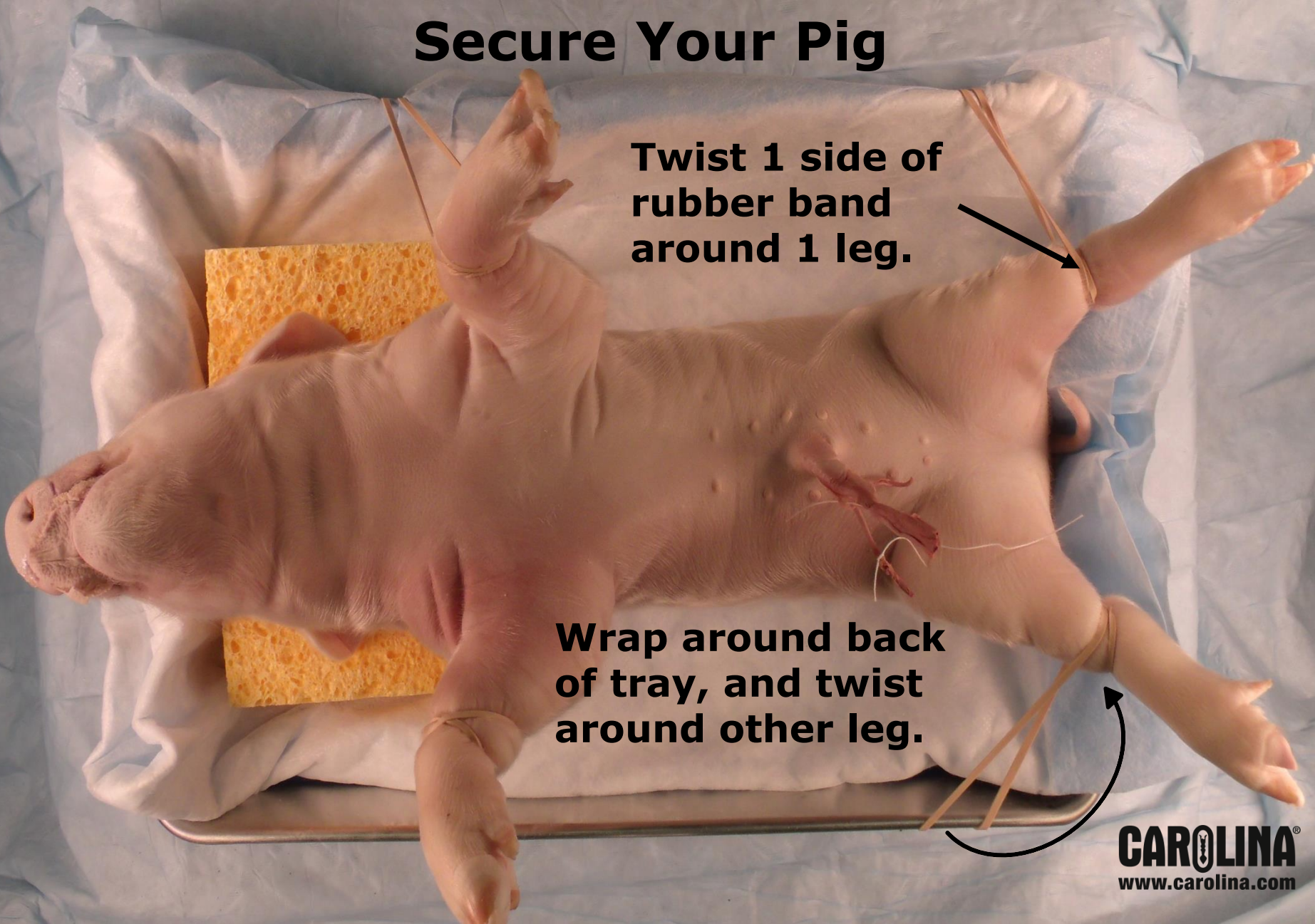
**Use rubber
bands to hold
pigs in position.**

**Place white pad in
pan for easy cleanup.**

Secure Your Pig

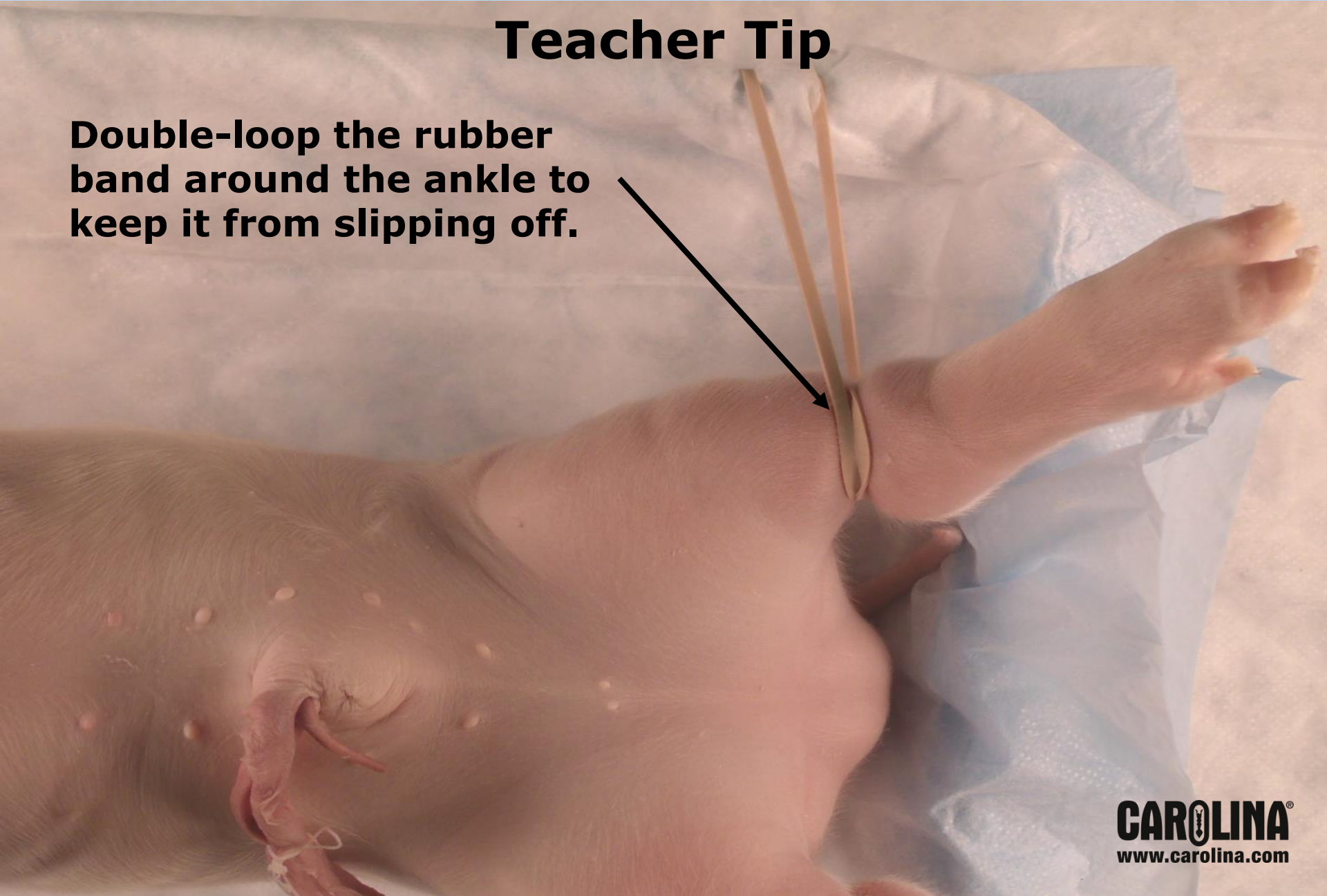
Twist 1 side of rubber band around 1 leg.

Wrap around back of tray, and twist around other leg.



Teacher Tip

Double-loop the rubber band around the ankle to keep it from slipping off.





External Anatomy

Examine external features of the head:

- ✓ **Hair**
- ✓ **Mouth**
- ✓ **Nostrils**
- ✓ **Tongue**
- ✓ **Ears**
- ✓ **Eyes**

Male

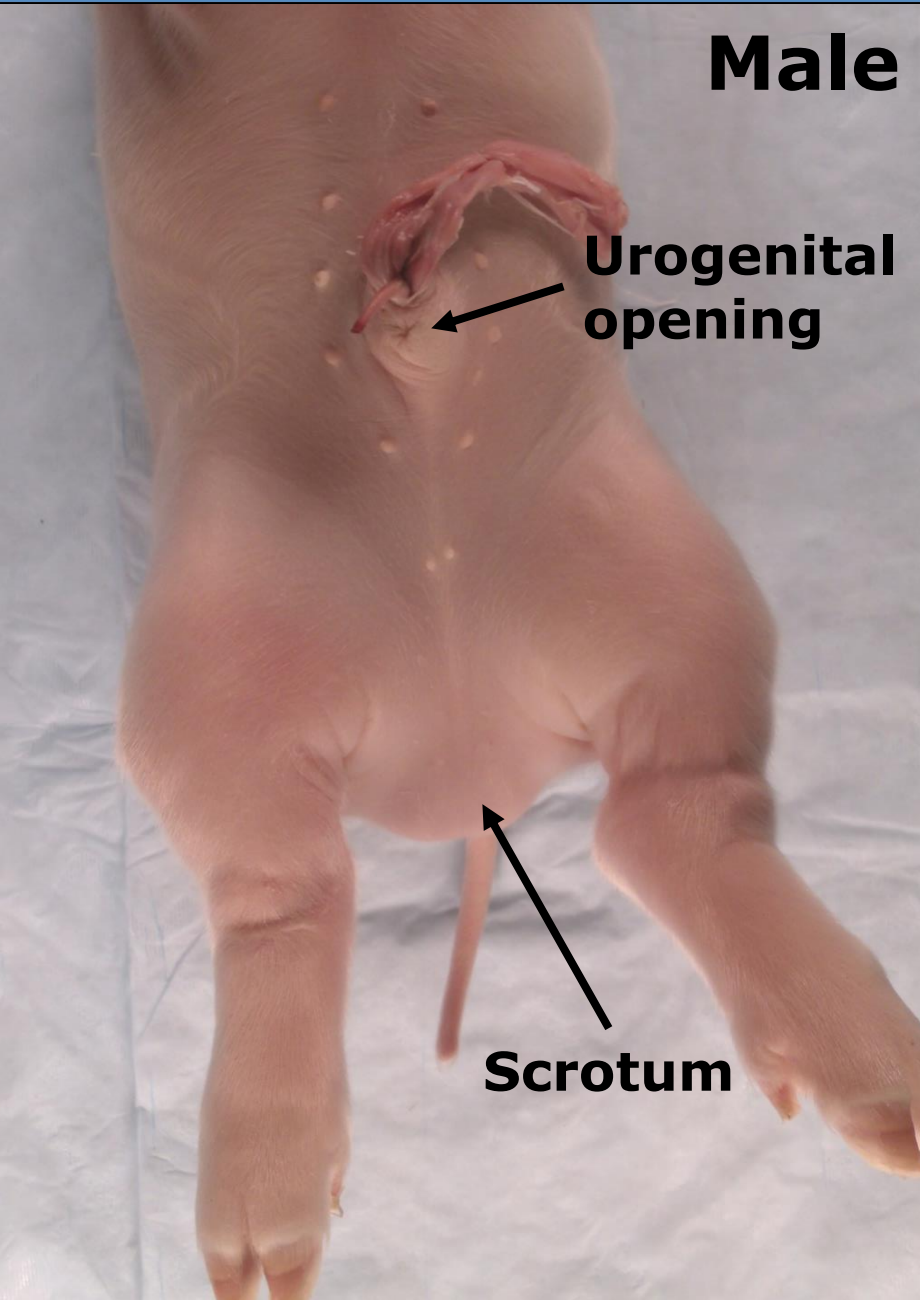
**Urogenital
opening**

Scrotum

Female


**Genital
papilla**

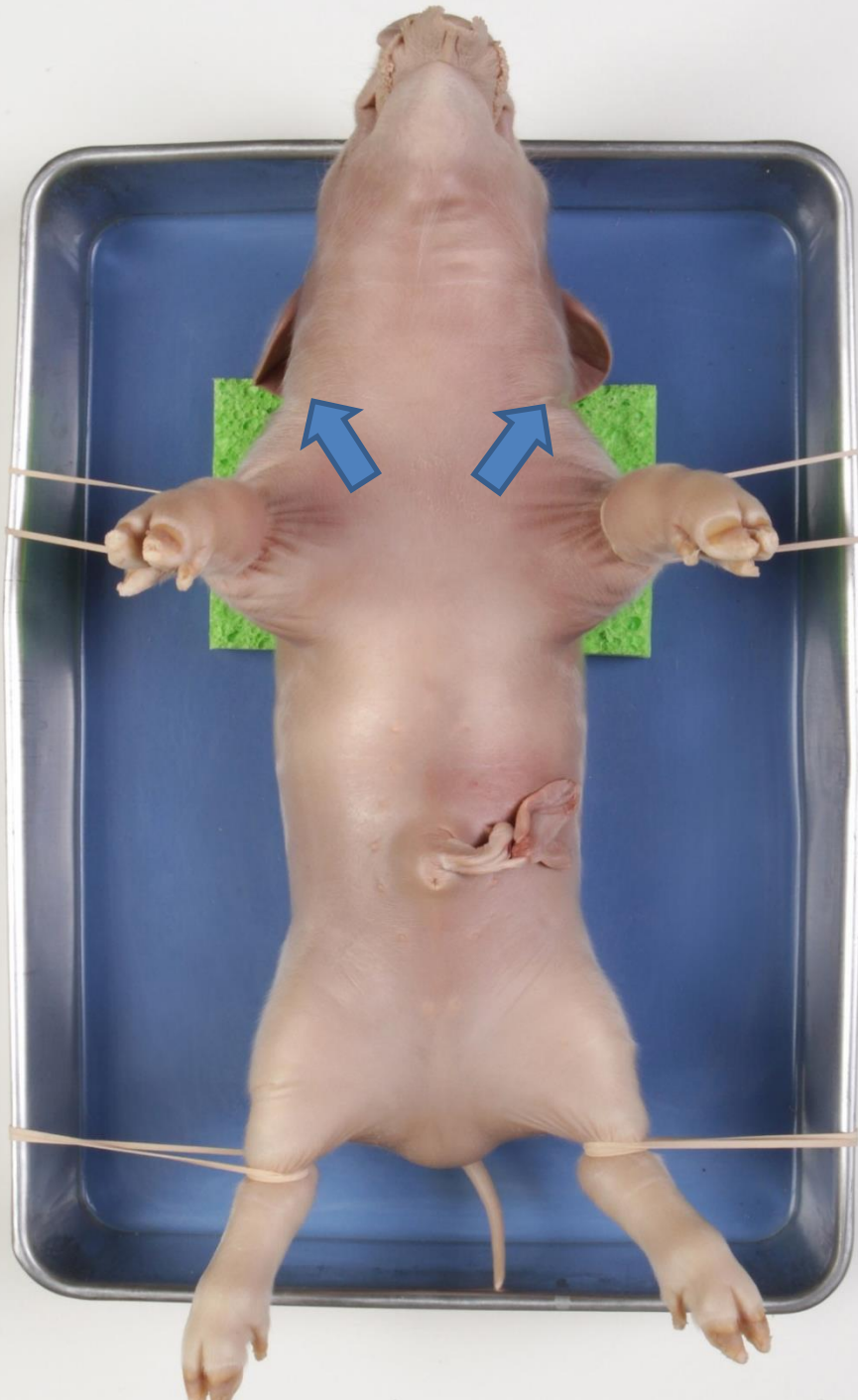
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Prepare for Internal Anatomy

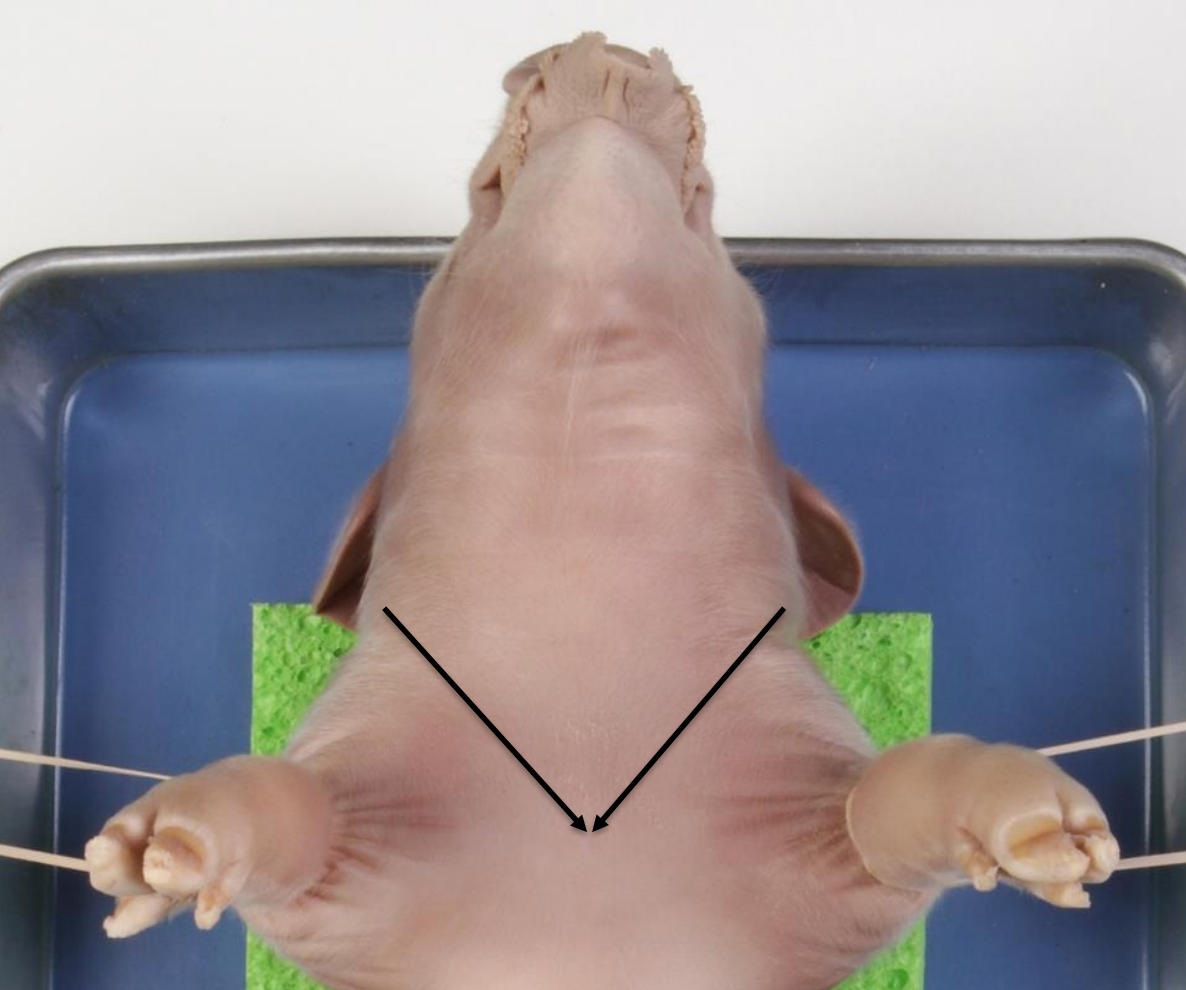
The initial incisions will expose the structures of the neck.

Feel for the space between the top of the shoulder and the corner of the jaw indicated by the . This is where the initial incisions will begin.



First Incisions

Make the V-shaped cut indicated by the black arrows.

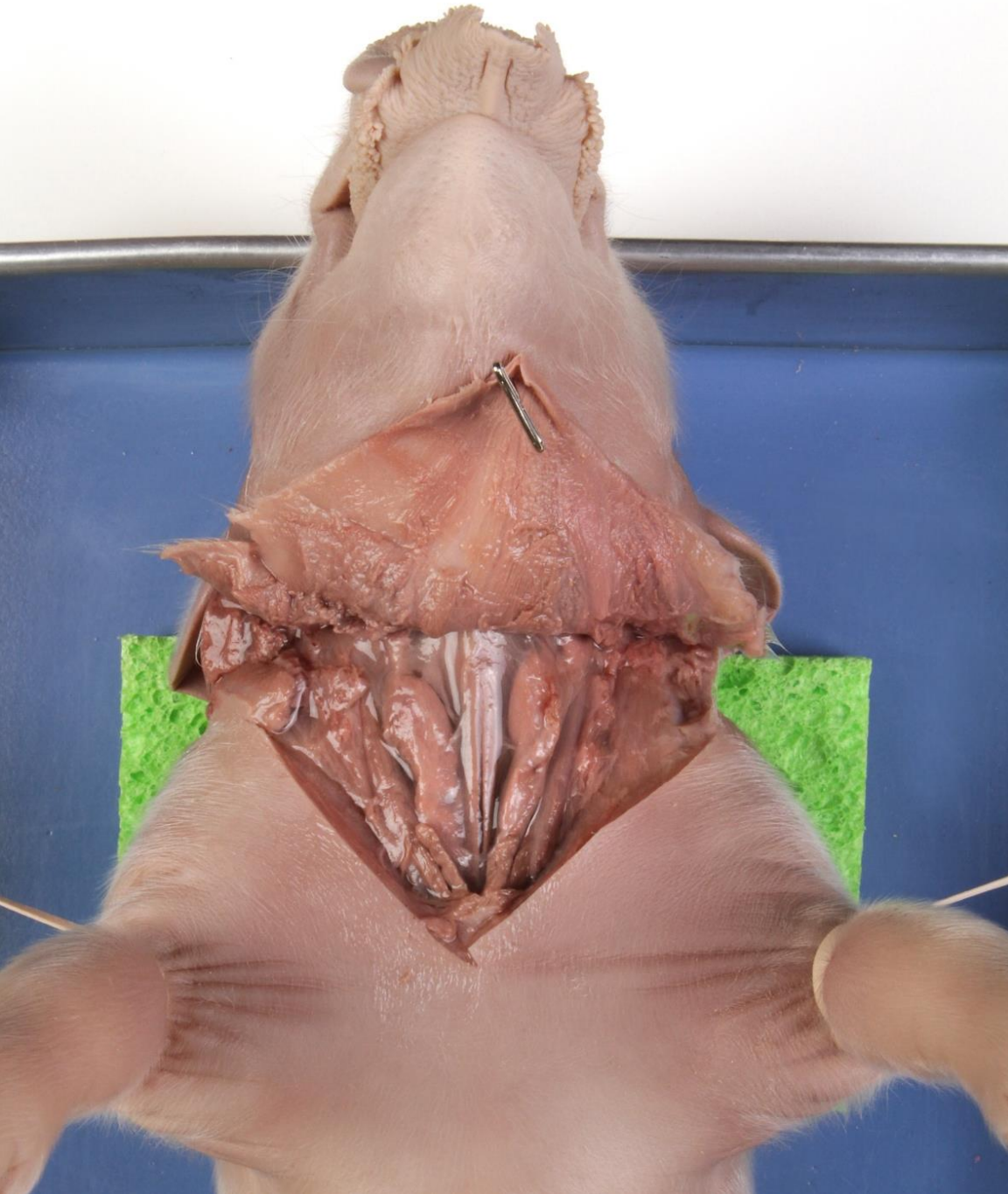


THE INITIAL CUTS SHOULD BE SHALLOW, cutting only through the skin and first layer of muscle!

First Incisions

Lift the V-shaped flap and pull it gently upward.

Use the tip of the scalpel to assist in lifting the flap.



The Neck

Thymus Gland Tissue

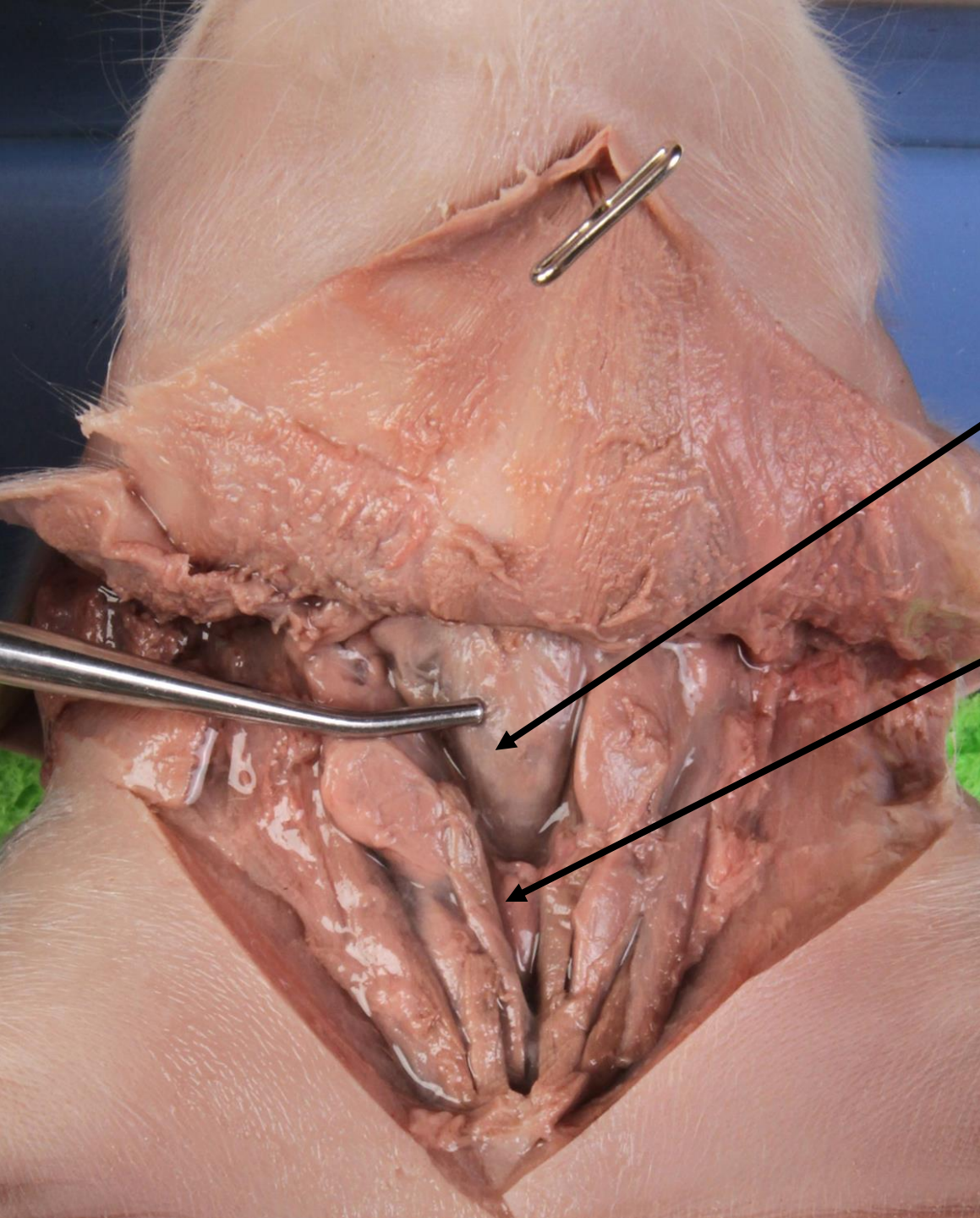
Push the thymus tissue to either side with your blunt probe to expose the **thyroid gland** and **larynx** below, lying between these 2 masses.

The Neck

Larynx

Thyroid Gland

Gently push the thyroid gland to the side to reveal the rings of the **trachea**, connected to the **larynx**.

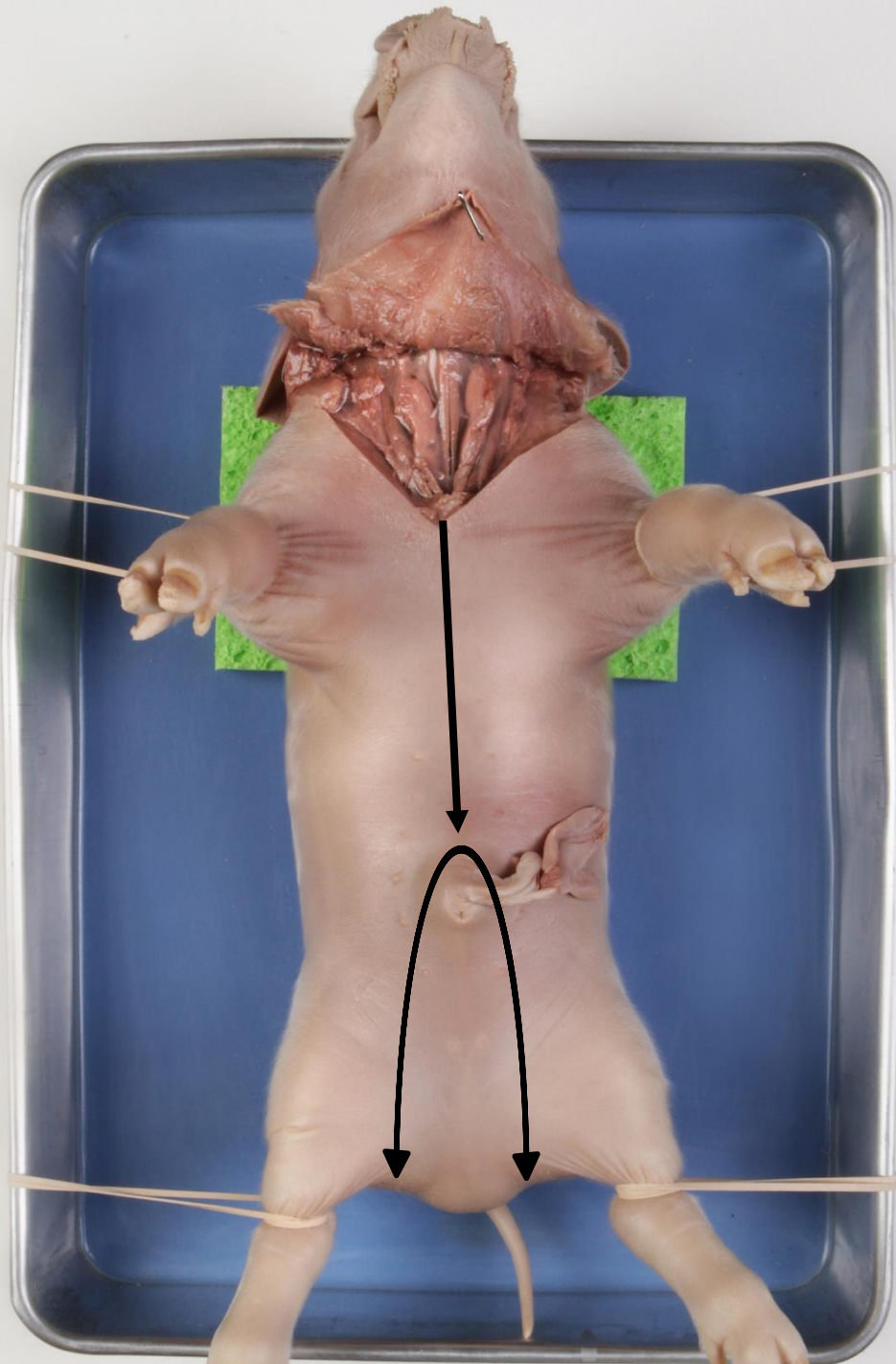


Finishing the Classic Y Incision

Continue cutting the tail of the Y incision until you reach the umbilical cord.

Cut around the top of the umbilical cord. Continue the cuts, in parallel, toward the posterior of the pig.

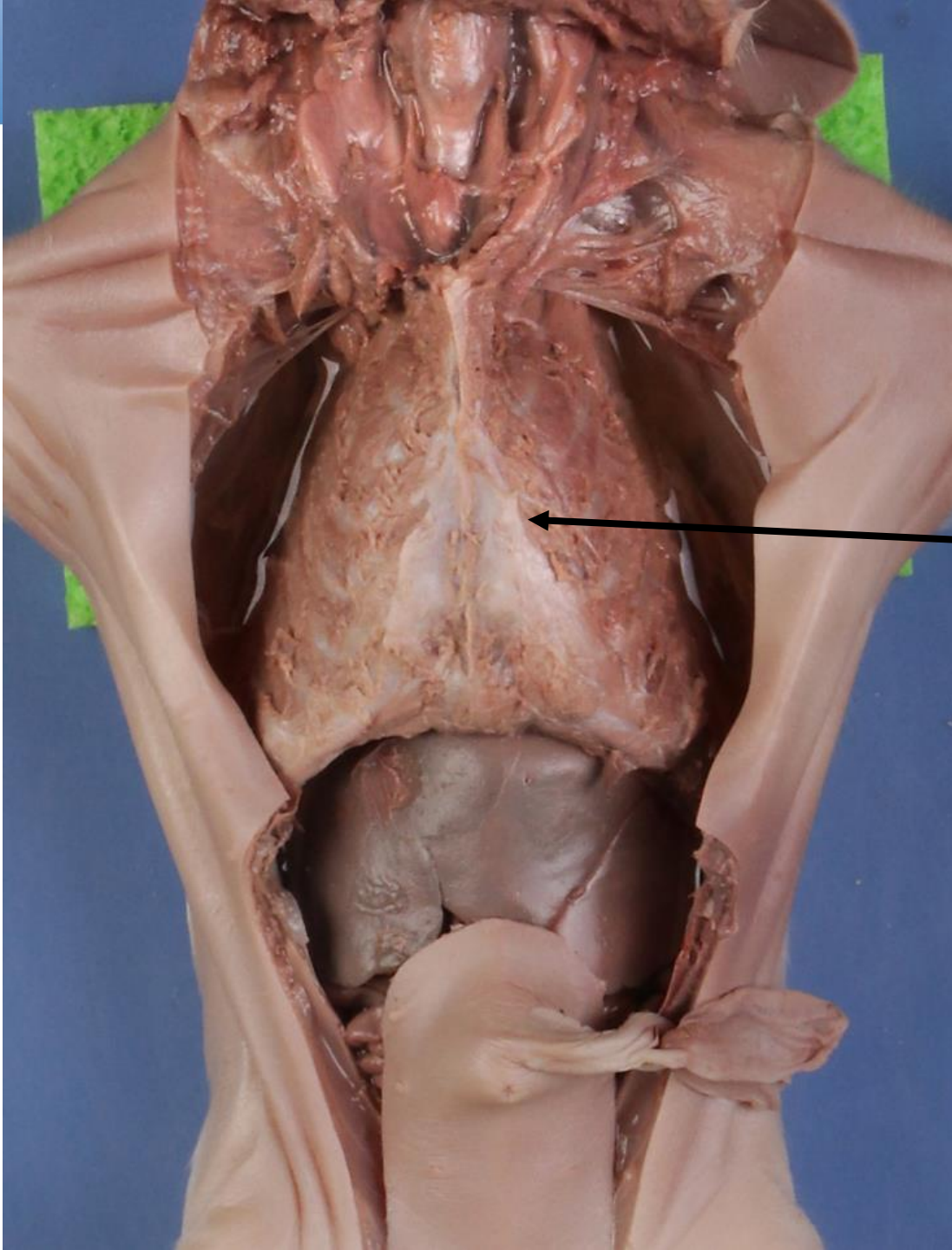
THE INITIAL CUTS SHOULD BE SHALLOW, cutting only through the skin and first layer of muscle!



Finishing the Classic Y Incision

Use your scalpel to peel the skin and tissue away from midline incision to reveal the **chest plate**.

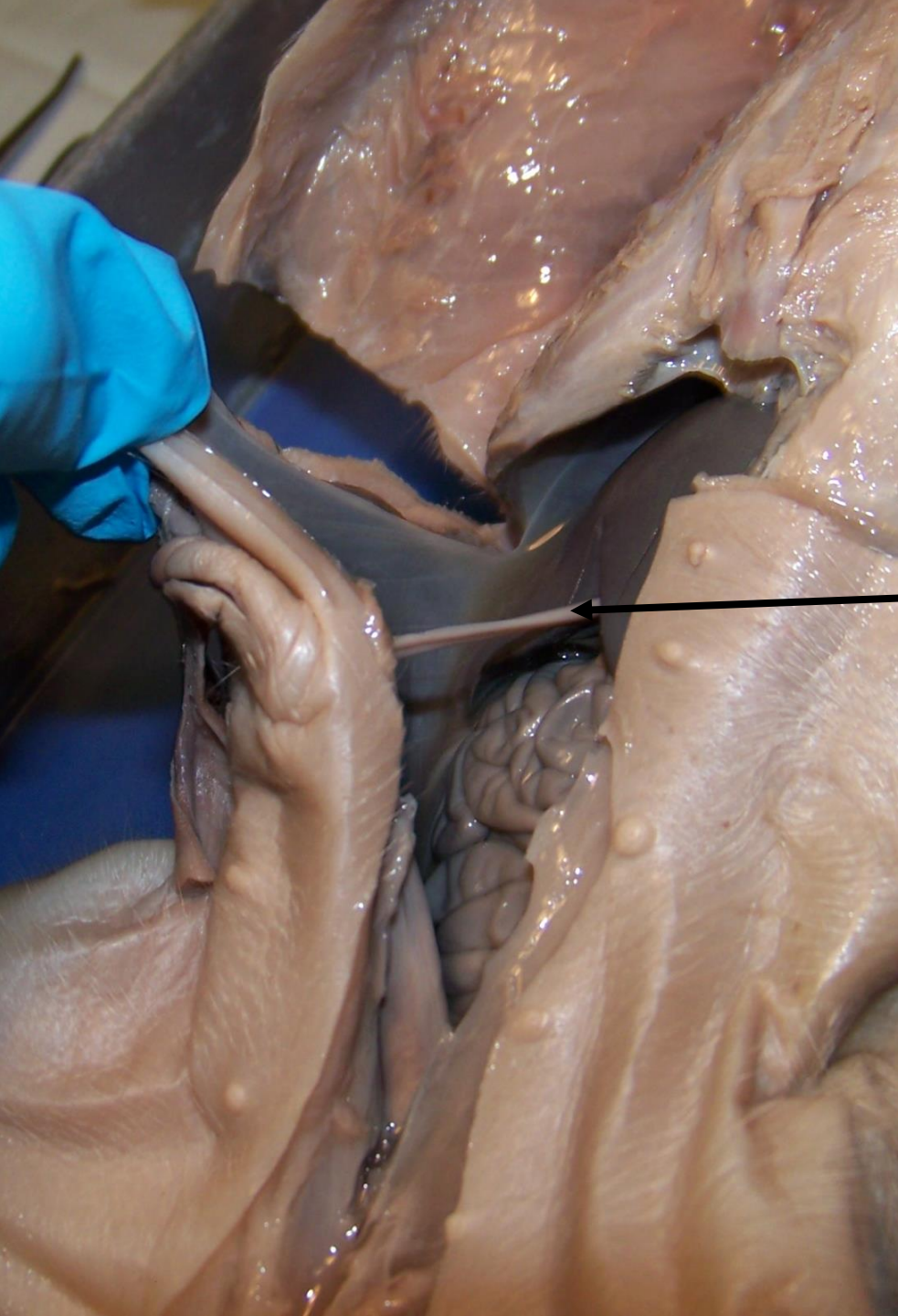
DO NOT CUT THE CHEST PLATE!



Finishing the Classic Y Incision

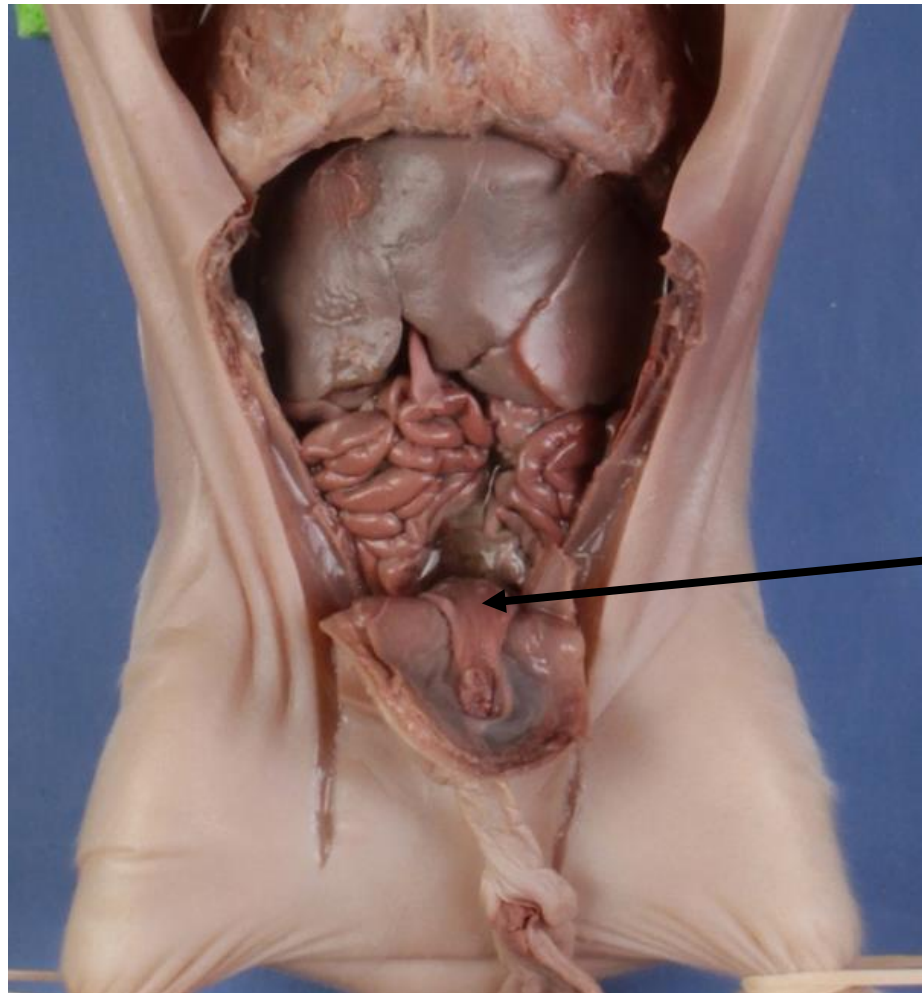
Pull back the skin flap containing the umbilical cord.

Locate the **umbilical vein** connected to the liver. Snip this vein and lay the skin flap between the back legs.



Finishing the Classic Y Incision

On the skin flap, locate the **urinary bladder**. It is a deflated, muscular sac that can be detached from the skin flap.

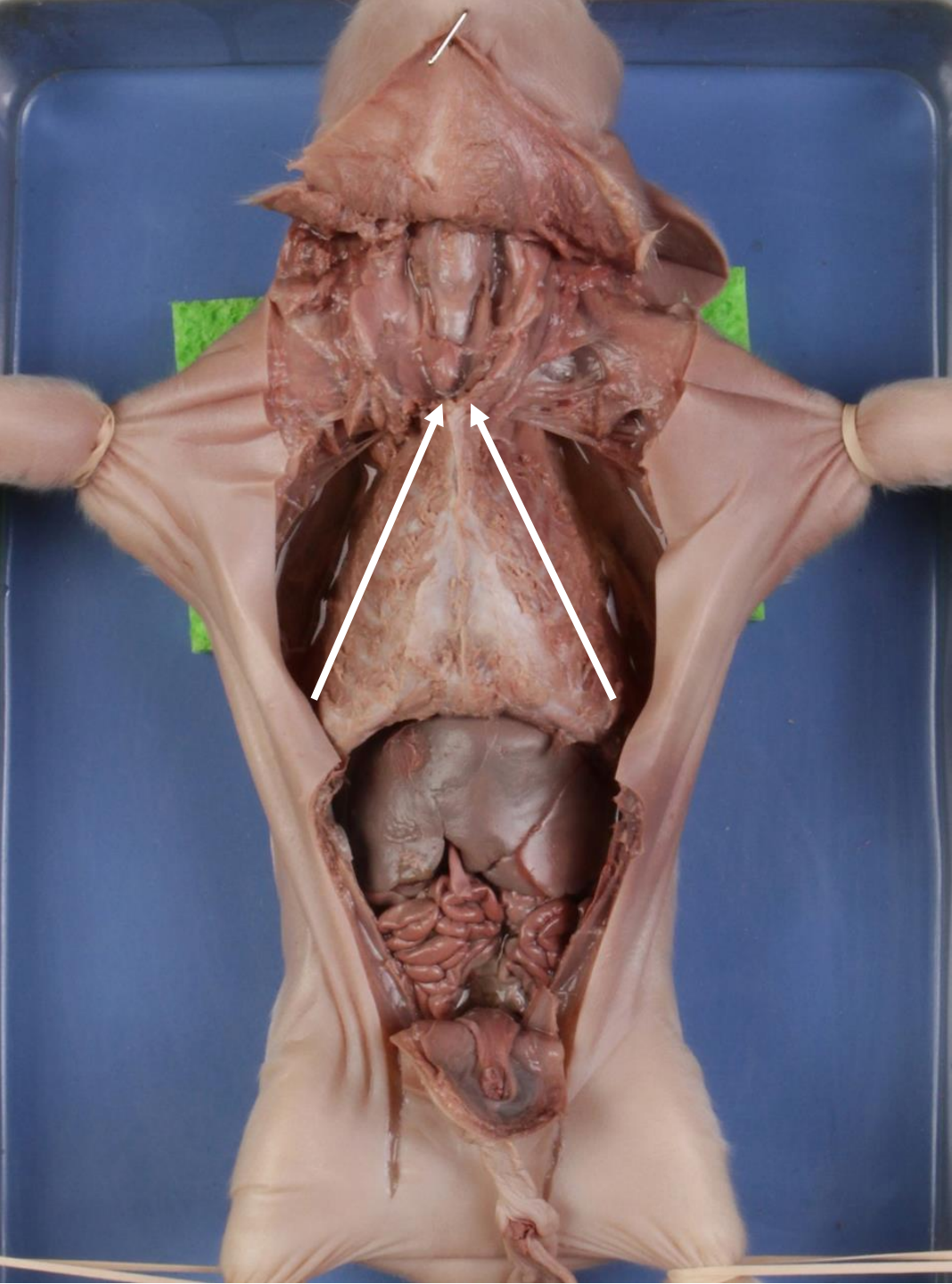


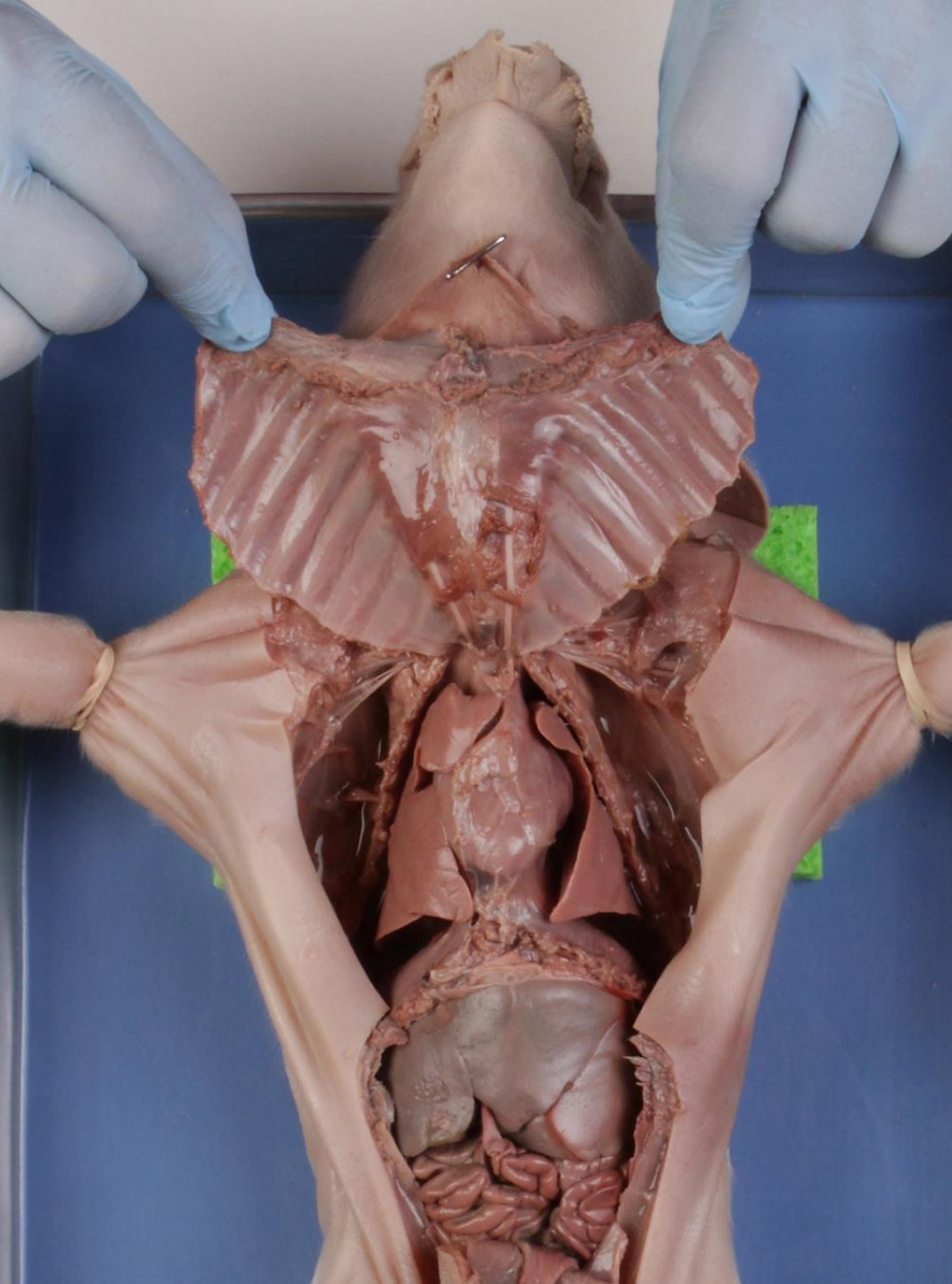
**Urinary
Bladder**

Removing the Chest Plate

Cut up each side of the rib cage as indicated by the white arrows.

Stay low in the chest cavity.



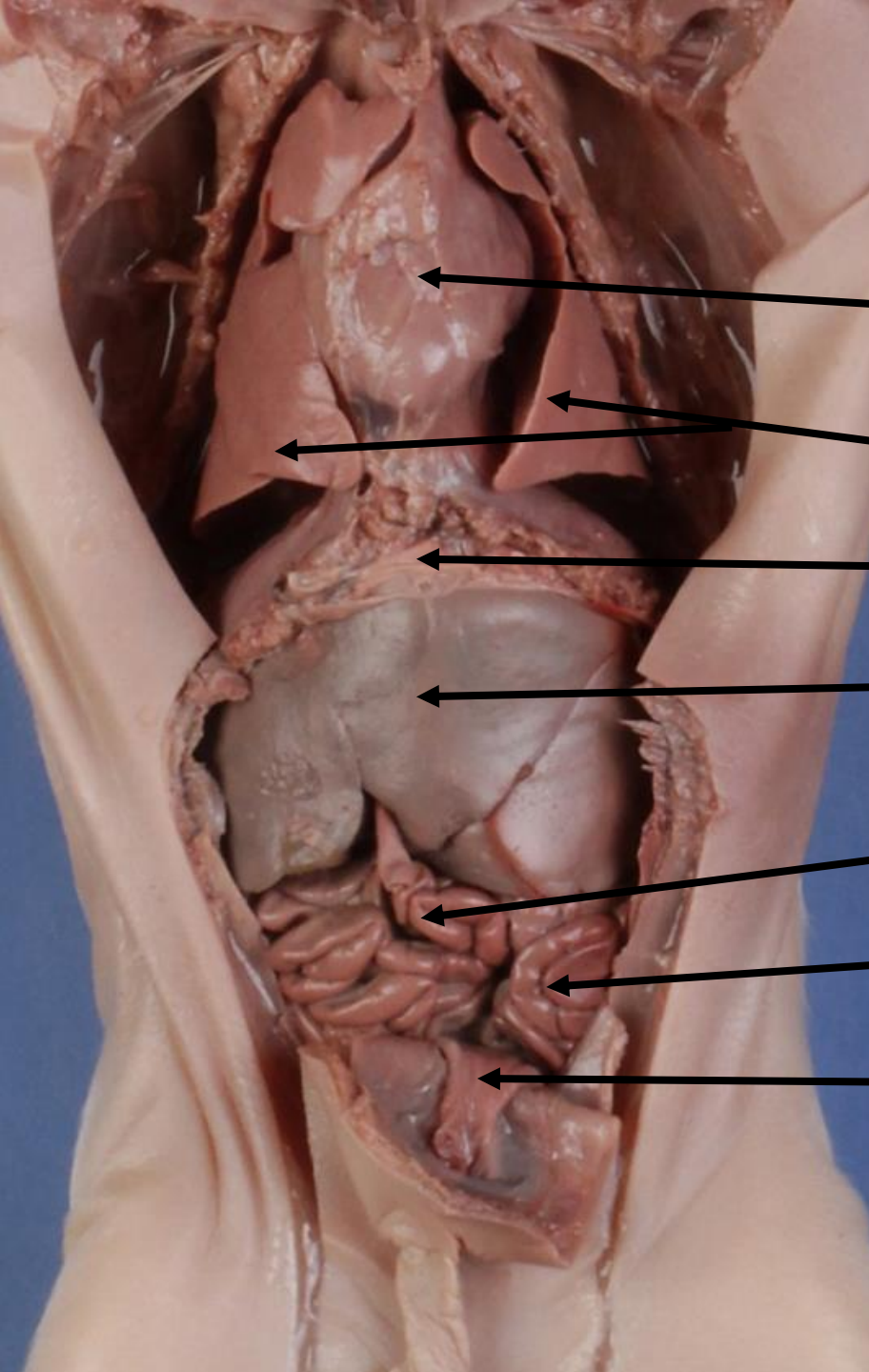


Removing the Chest Plate

The **diaphragm**, a thin sheet of muscle, may still be attached at the bottom of the rib cage. Cut the diaphragm away, so the chest plate can be lifted.

Snip the apex of the chest plate and remove it completely.

Chest Plate Removed



Heart (with overlying thymus and pericardial sac)

Lungs

Diaphragm

Liver

Small Intestine

Large Intestine

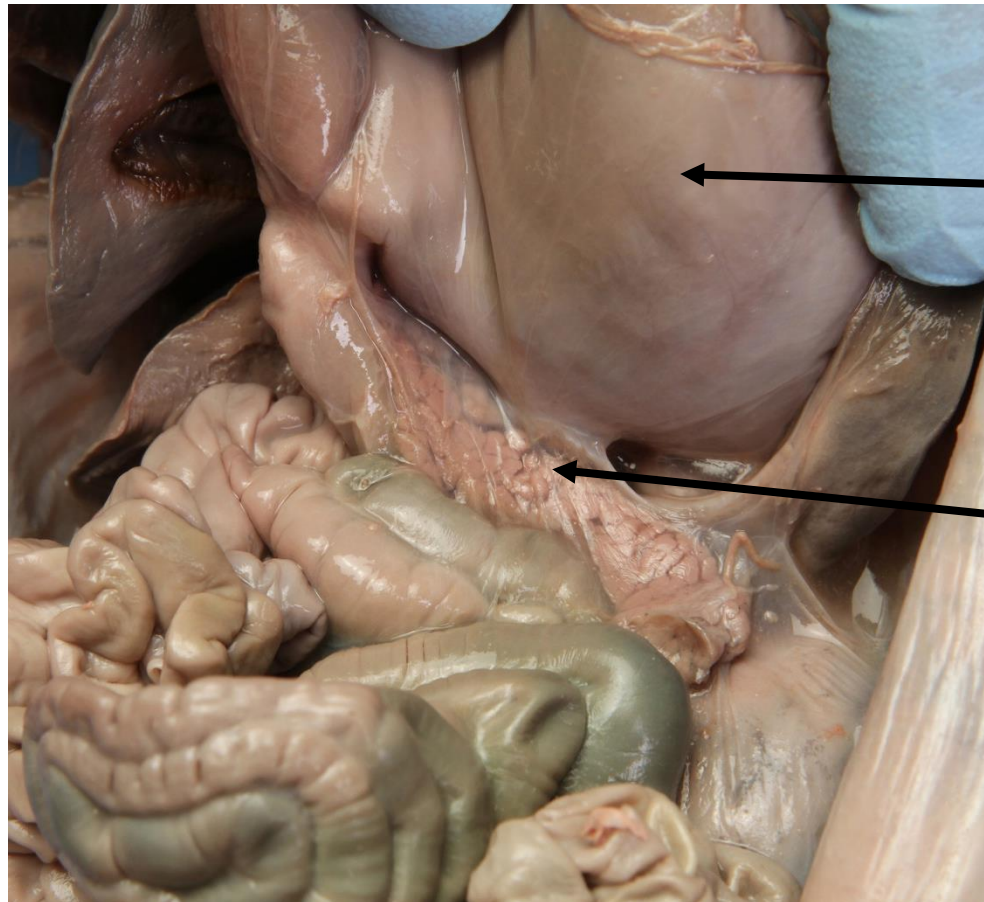
Urinary Bladder

Chest Plate Removed

Locate the pancreas:

Gently lift the stomach.

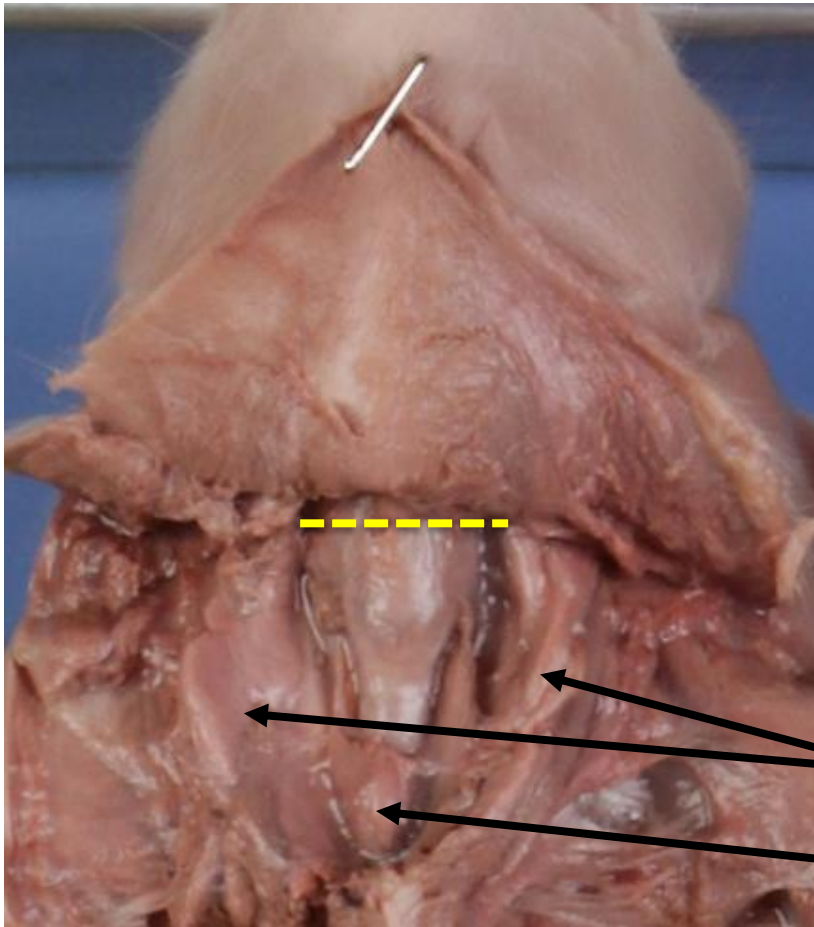
Look for the glandular tissue in the crease between the bottom of the stomach and the top of the intestines.



← **Stomach,
Lifted**

← **Pancreas**

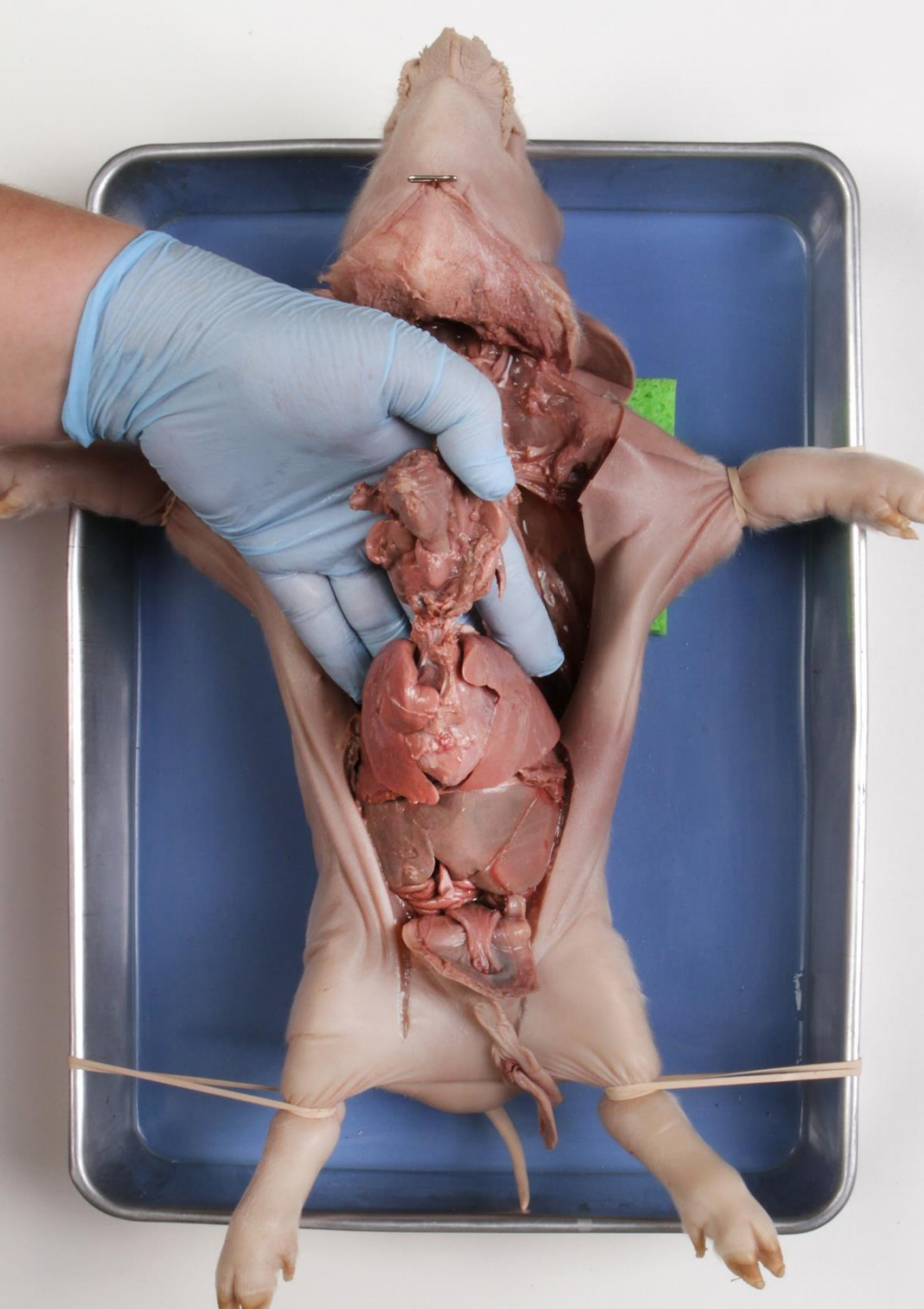
Removing the Organ Block



Make the initial incision at the top of the **larynx**, indicated by the yellow dashed line.

With your fingers, lift the **larynx** and gently begin to pull downward.

Try to remove all of the **thymus** and **thyroid gland**.



Removing the Organ Block

Continue to gently pull downward.

Make sure you have included the **esophagus**, a muscular tube, lying posterior to the trachea.

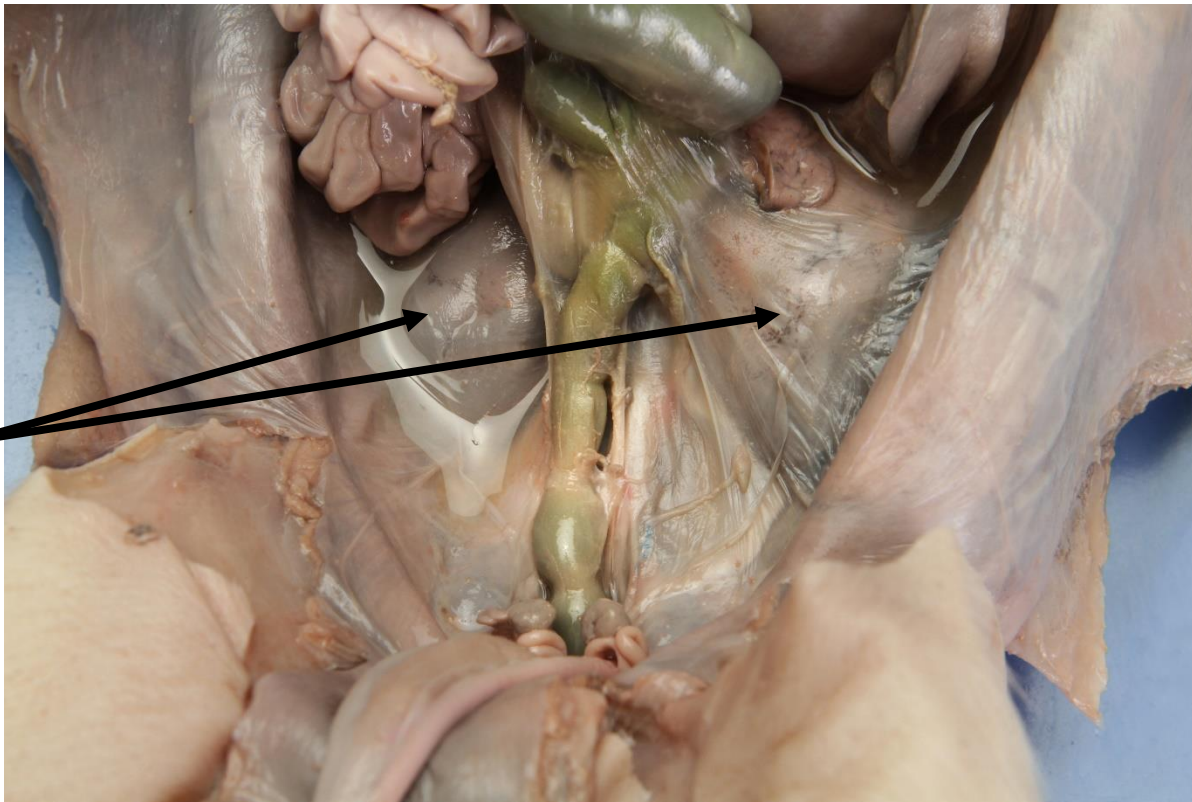
Use your hand or the tip of the scalpel to help remove the connective tissue that holds the organ block in place.

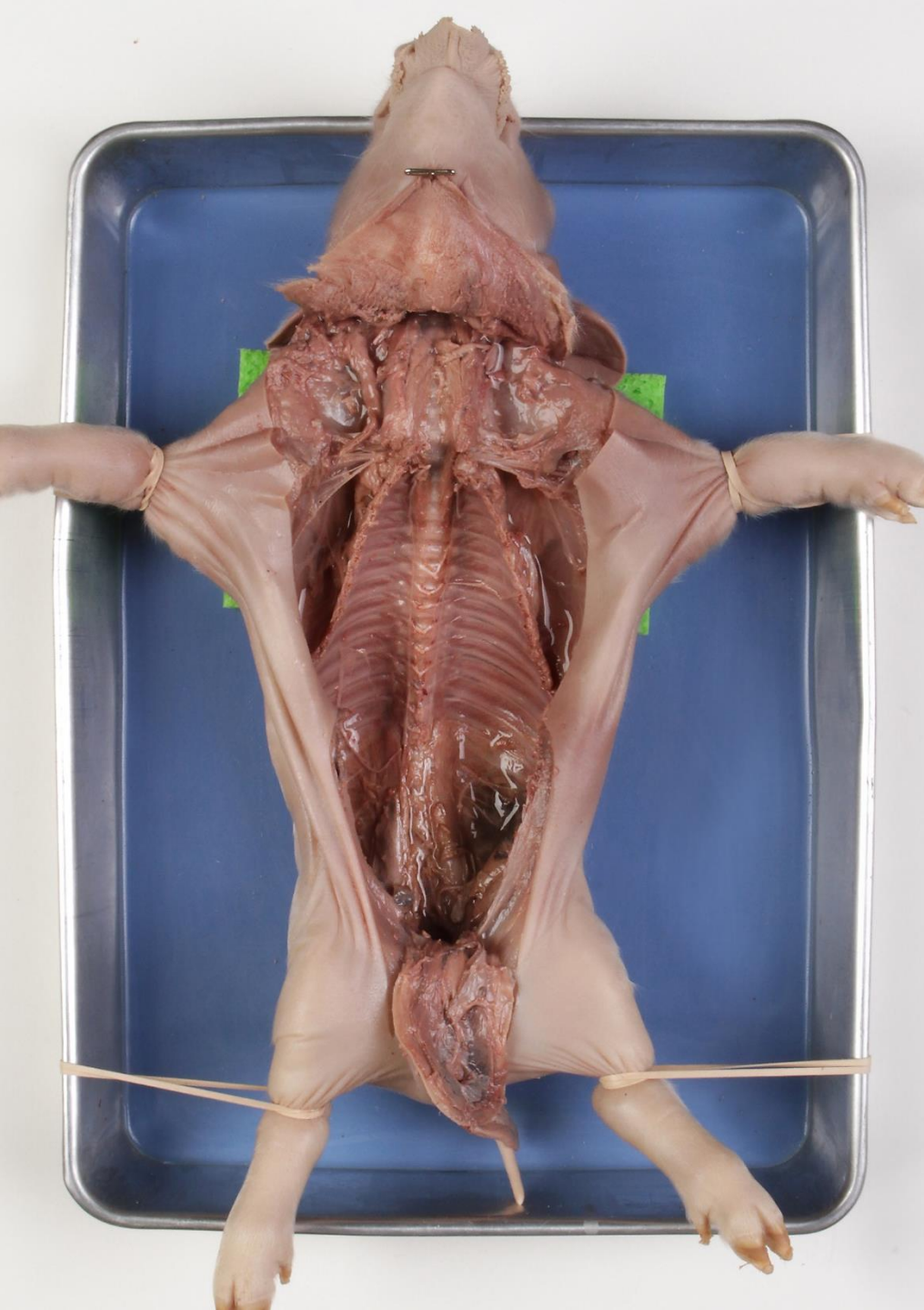
Removing the Organ Block

As you pull upward, note the **kidneys** covered by a thin membrane in the posterior of the abdominal cavity.

Try to remove these with the organ block. If you cannot, they can be removed later.

Kidneys





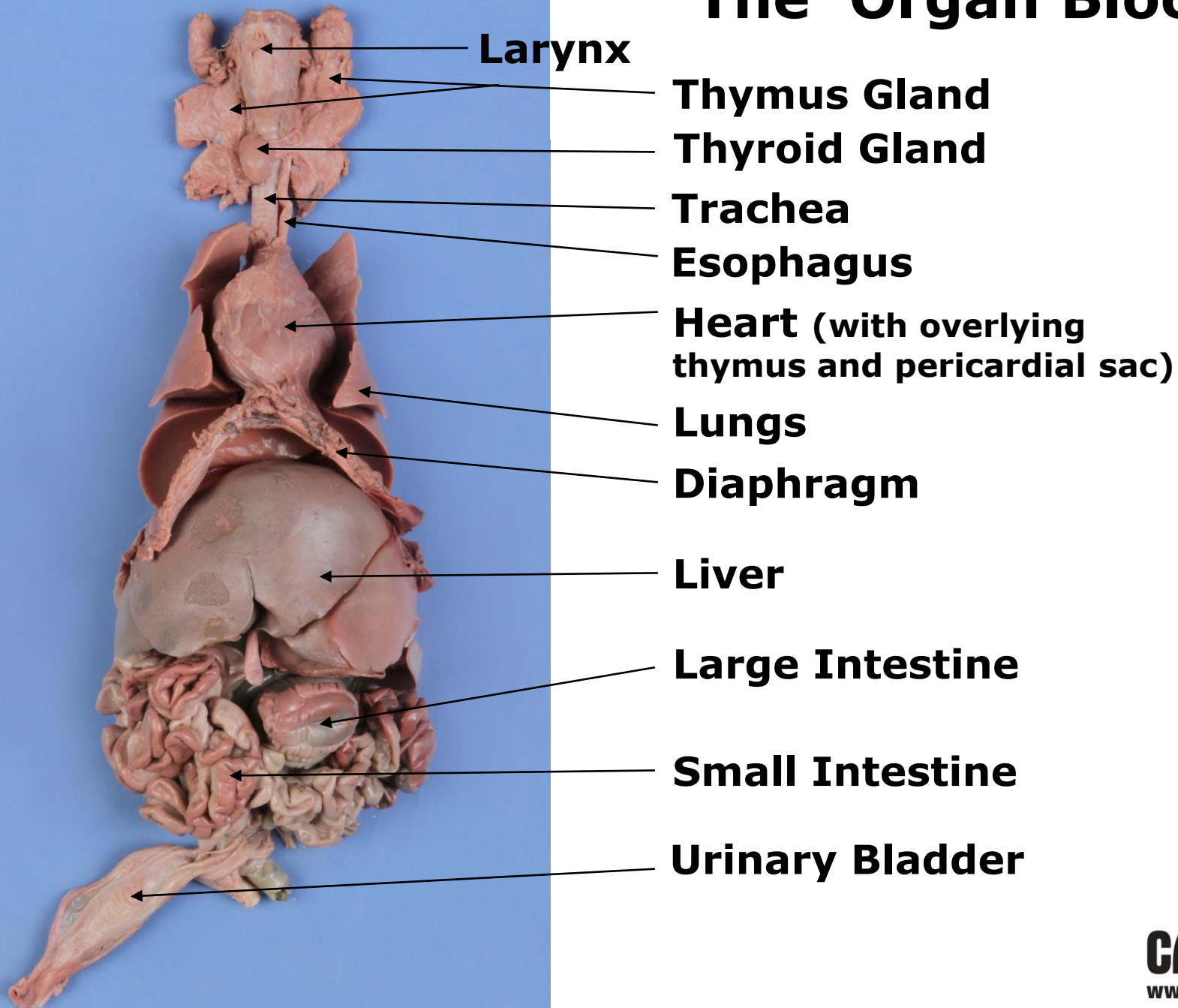
Removing the Organ Block

At the lowest point of the **large intestine**, make an incision.

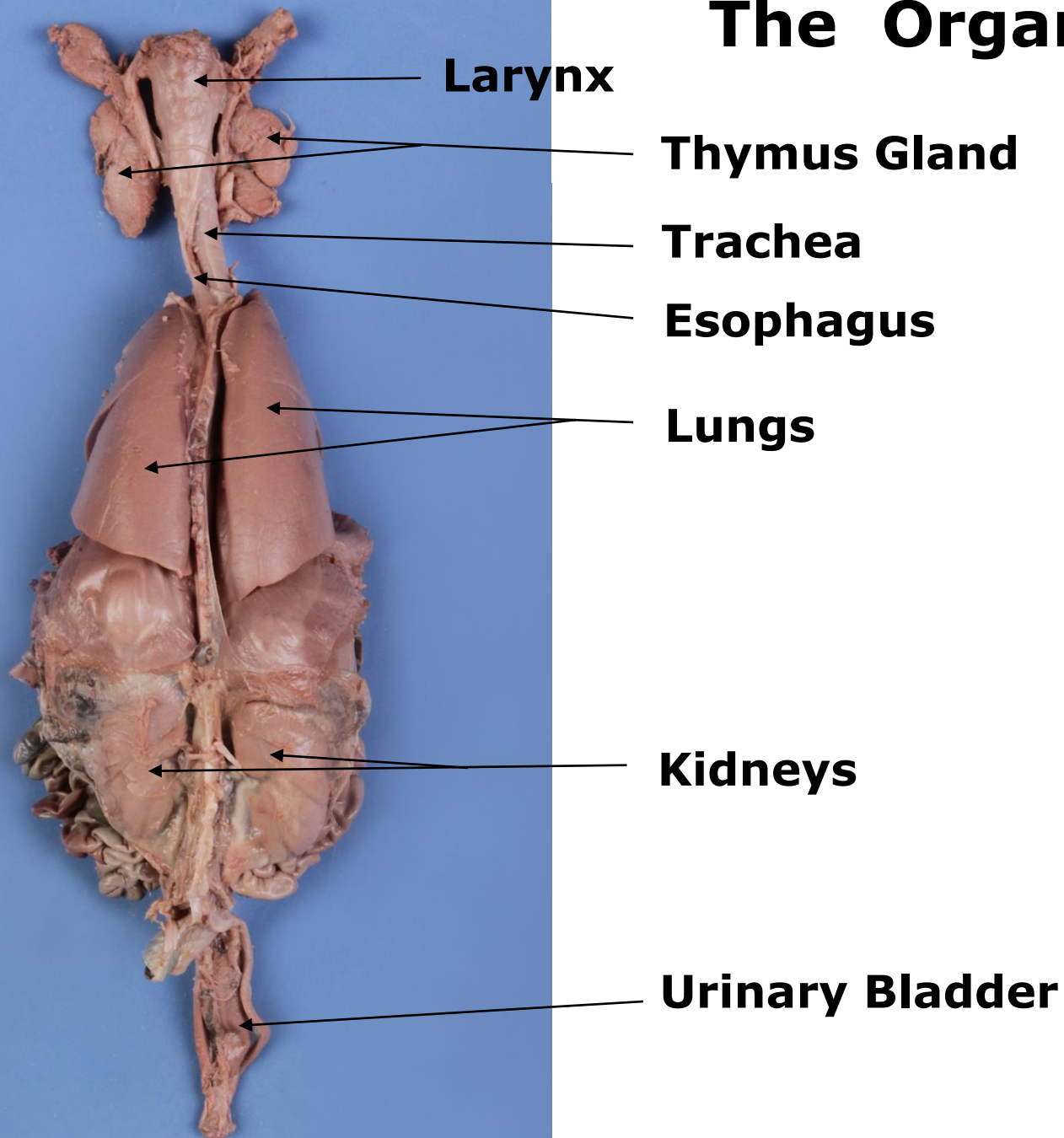
Proceed with removal of the organ block from the body cavity.

Make sure to also remove the **urinary bladder** from the skin flap.

The Organ Block



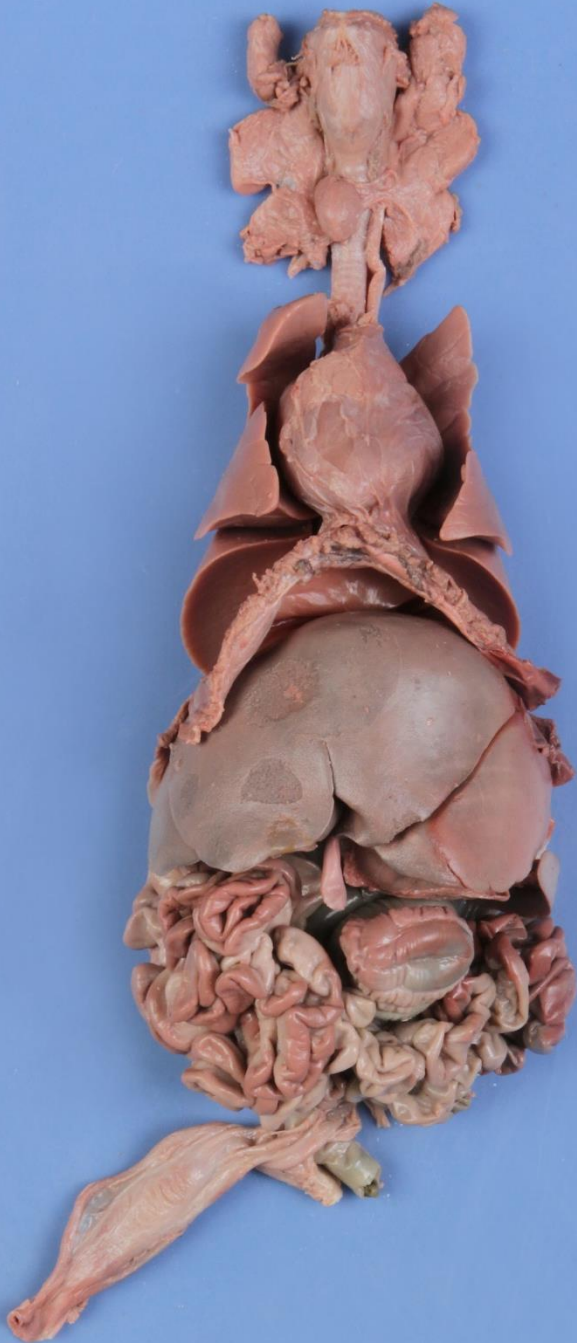
The Organ Block



The Organ Block

In the kit, students would now:

- **Remove organs individually**
- **Make observations of each organ**
- **Measure the length and mass of each organ**
- **Record all data in the Autopsy Report**



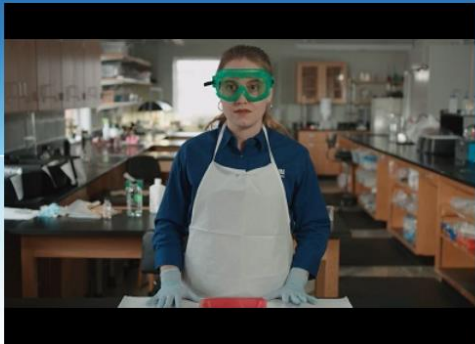
Carolina® Forensic Dissection Kit

With the purchase of this kit, you receive 1-year free access to digital resources including dissection safety videos, fill-in student guides, and pre-lab and post-lab assessments.

CAROLINA® Carolina Dissection BioKits®:
Safe Dissection Techniques Prelab Activity

2 / 4

Dissection Safety: Watch the video and answer the questions below.




True False

1. Goggles protect the eyes from both splatters and sharp objects.

☐ ☐

Digestive System - General

Digestive System: Label the structures below.



Labels: ---, ---, ---, ---, ---

Bringing Home the Bacon!



Return all of the organs to the body cavity and suture the incisions.

Cleanup Instructions

- **KEEP GLOVES ON!**
- **STAY AT YOUR TABLE.**
- **Separate animal waste, tools, and trash.**
- **Only place animal waste in buckets.**
- **All other trash goes in trash bags.**
- **Wipe out pans, clean tools, and wipe off tables.**



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2019 Carolina's
Perfect Solution®
catalog for
great deals on our
BEST specimens!



We Can Meet Your Dissection Needs



Top-quality specimens and supplies



Additional Resources from Carolina

Carolina® Dissection Mats and Flip Charts

Guide students through dissection, teaching internal and external features.



Carolina Offers Free Resources to Support Teachers

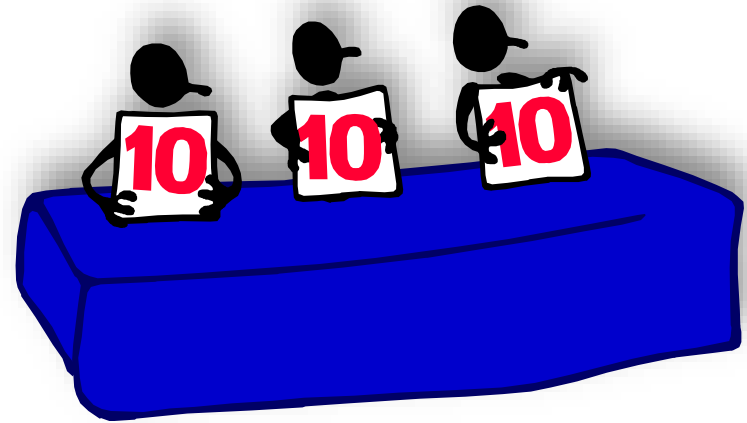


carolina tips®



Evaluations: Share Your Thoughts

**We are striving to
make our workshops
great!**



**Please evaluate this session and presenter
on a scale from 0 to 10 (10 = best).**

**Please help us reset the room
by gathering your belongings
and exiting between sessions.**

THANK YOU!